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THE JOURNAL OF PHILOSOPHY
PSYCHOLOGY AND SCIENTIFIC METHODS

SENSATION AND PERCEPTION

I. The Genetic Relationship

As present-day psychology conceives it, the sensation is one, perhaps the most important, of the elementary conscious processes. It marks the limit, at least in one direction, to which we can carry our introspective analysis of the contents of consciousness. In the adult the sensation occurs always in combination. One never experiences sensations which are not structural elements in perceptions or other complexes. Colors, for example, are seen as the colors of or on things; the tones are elements in voices or other complex sounds, or, at least, they are heard as coming from a certain direction; the cutaneous sensations are the consistencies and temperatures of hard or soft, warm or cold, things; etc. It is possible, however, by introspection to analyze out the simple sensations which go to make up, say, our percept of a red paper disc, and to attend merely to the red color. By such means we can study the sensation itself and observe the characteristic changes it undergoes. As the psychologist is at pains to point out, the sensation thus isolated by attention has *ipso facto* undergone certain changes of attribute. As an elementary constituent of the complex percept, it is, he says, an artifact, an abstraction, whose characteristics in the limbo of inattention can only be assumed. Some of the difficulties of this conception I have discussed in a former article.[1]

But the sensation is not regarded merely as an analytic element, but as a genetic element as well. While certain of the more careful analytic psychologists, like Professor Titchener, for example, are at pains to discriminate between the analytically simple and the genetically prior, and to point out that the elements reached by analytic introspection of adult consciousness are not to be taken as genetic elements, it is nevertheless true that the sensation does figure very widely as genetically primary. Experience of sensory qualities is put first in the development and is the prius from which the complex

[1] "The Psychological Element," *The Philosophical Review*, July, 1915.

percepts of things are derived. Thus we find even such a man as Baldwin saying: "The child begins in its prenatal and early postnatal experience with blank sensations and pleasure and pain with the motor adaptations to which they lead, passes into a stage of apprehension of objects with response to them by "suggestion," imitation, etc.[2] And again more significantly: "The study of children is generally the only means of testing the truth of our mental analyses. If we decide that a certain complex product is due to a union of simpler mental elements, then we may appeal to the proper period of child-life to see the union taking place . . . there is hardly a question of analysis now under debate which may not be tested by this method."[3] The psychical structures as they exist in the adult have, it is held, been formed almost entirely in the course of his individual experience. So when the complex percept is pulled apart until the process of analysis can reach no further, it is assumed that the elementary constituents thus reached are older in the mental life than the percept which they formed. The success of introspection depends precisely on the completeness with which the work of experience is undone. In fact, it is largely from this that its difficulty arises. The student entering the laboratory must first of all learn to forget his acquired habits of "common sense." He must, in other words, abstract from all *meaning*. He must observe, not the whirling disc nor the chilly point of the steel, nor the prick of the needle, but this *red*, this *pressure*, this *pain*. In thus paring away all the meanings which experience has developed he is at the same time breaking down the complex percepts into their constituent elements, and—so it is assumed—putting himself as nearly as may be at an earlier stage of development. This difference is indeed admitted: that whereas the sensation to which introspective analysis leads is possessed of a maximum of clearness, being in the focus of a highly concentrated attention, the sensations of the infant float in a field which is in the lowest degree differentiated by attention. Still, it is thought, the sensations *are there* from the beginning, although they have not as yet been discriminated by attention. and out of them the perceptual complexes of mature life are organized. Even among psychologists who repudiate many of the doctrines of the so-called sensationalistic school, it is believed that cognitive experience, any experience of the meaningful, is later than mere sentience, the passive receptivity to the impressions of sense. It is indeed almost a universal belief that the child experiences colors, hears sounds, feels pressures, long before he sees balls, hears voices, or feels solid objects.

[2] "Mental Development," page 17.

[3] *Ibid.*, page 15.

It is this doctrine of the genetic primacy of the sensation that I wish to criticize. The thesis to be presented in this paper is that sensations are not genetic elements, but are the products of the same individual development which yields perceptions. The child does not see colors, and can not see them, until, and in so far as, he has already learned to see objects. He does not hear tones until he has learned to hear voices and footsteps, nor feel pressures and muscular sensations until he has learned to feel hands and bottles and rattles. The one capacity develops *pari passu* and is correlative with the development of the other. That is to say, the stimulation of a differentiated end-organ yields a sensation of specific quality only if this sensation has already become a constituent element in perception. The development of meaning is one side, the generation of qualitative distinctness is the other side, of one and the same process of differentiation and integration. Thus if it be a falsification of early experience to describe it in terms of meaning, it is equally a falsification to describe it in terms of the existential, or given.

In the first place, it may be pointed out that this thesis is in harmony with the general facts of evolutionary development. The relatively homogeneous and undifferentiated regularly precede the heterogeneous and specialized. Consequently the assumption reasonable *a priori* is that the beginnings of conscious life possess a minimum of diversification and specialization. Now to suppose that the conscious life of the child begins with the sensing of an indefinite number of distinct visual, auditory, and olfactory qualities, together with those yielded by the cutaneous, muscle, and joint end-organs, is in flat contradiction with this presumption of initial homogeneity. It is claimed, of course, that all the organization of conscious life into complex and interdependent structures and functions takes place during the growth of the individual from infancy to maturity, and the process may continue far into old age. But no new structural elements are supposed to be generated in the process, which is conceived solely as a complication of those existing at the beginning. It is as if the body began its career with a full complement of bone-cells, muscle-cells, skin-cells, liver-cells, etc., and its development into an organism were brought about by the redistribution of these. The psychologist points out, to be sure, that the elementary sense-qualities are, for long, undiscriminated and unattended to; but the infants' experience is nevertheless supposed to contain them in kaleidoscopic confusion, very much as Empedocles's primitive world contained a jumble of arms, feet, ears, and hands. What meaning can be attached to the doctrine that color qualities which have never been discriminated are yet present as existentially distinct conscious ele-

ments, seems very doubtful. An undiscriminated difference would seem, indeed, to be indistinguishable from an undiscriminated identity. But however that may be, one might well argue that there was no more reason for supposing psychic life to begin with *disjecta membra* than for the belief that bodily life so begins. So far as we are to be guided by the general principles of organic evolution, the only reasonable assumption to make is that early conscious life is relatively amorphous, and does not possess anything so highly specialized as blues and reds, or high *c*'s and middle *a*'s. Instead of the gaze of the infant, as it wanders aimlessly around, encountering a particolored world, what it sees is more aptly to be described as "exciting," or "vaguely urgent," or "disquieting." As a matter of fact, however, the conscious content of a child is for long inexpressible in words at all; for words, being framed to denote the content of adult experience, are all hopelessly definite and discriminating. We can hope at most only vaguely to characterize, and not to express or describe it.

But if the generally accepted position is so widely at variance with the *a priori* probabilities, on what special grounds is it accepted? Surely, one would suppose, there must be strong and substantial arguments in its favor. If there are such arguments, however, they are not adduced by psychologists. The truth is that the doctrine in question seems to be one which, while tacitly accepted by almost every one so long as it is not challenged, is not actively defended by any one. But, though we do not find the doctrine actively defended, it is not difficult to discover the sources of its hold upon philosophical and psychological thought.

The first of these is the tradition of English empiricism and associationism,[4] from which psychology in the last quarter-century has been struggling to free itself, not as yet with complete success.[5] According to this tradition, analytic simplicity was frankly identified with genetic primacy, applied in political science, it led to individualism and the social contract theory; applied in ethics, it produced the hedonism of the eighteenth century, in which happiness was supposed to be built up out of atomic increments of pleasure; applied in logic, it resulted in the well-known theory that judgments come after concepts and are made out of them, while judgments in turn are put together to form syllogisms. But nowhere has the deceptive truth that "the simple precedes the complex" had wider application than

[4] This tradition is not, it is true, confined to empiricism, but was the common possession of all the thought of the period. The social-contract theory, for example, was not originated by empiricists.

[5] See article, "The Psychological Element."

in psychology itself. The formulated principle, that analytic simplicity is equivalent to genetic priority, would indeed be repudiated by most modern psychologists. But to deny the validity of a general principle, and to free oneself from the consequences of its former unquestioned acceptance, are, unfortunately, very different things.

It would, however, be unfair to modern psychology to suppose that its acceptance of the genetic priority of the sensation is wholly due to inertia in throwing off the yoke of pre-evolutionary dogmatism. There are certain very apparent reasons for supposing that the child has, either at birth or soon after, the capacity for receiving sensations; while it is almost equally apparent that he does not acquire the ability to see objects as significant wholes until later. No doubt it will be urged against what has already been said, that early experience in the race was admittedly relatively amorphous, since our early ancestors, like the simpler forms of animal life to-day, did not possess specialized sense-organs. The possible "structural" diversity of the content of the consciousness is determined by the diversity of the external stimuli to which the organism is a subject. If conscious life is present before birth, no doubt it is far more homogeneous and less differentiated than the consciousness of the infant after birth. But with a hypothetical pre-natal conscious life psychology has no concern. The child is equipped at birth with a full set of sense-organs, and if some of these, like the ear, do not function at birth, it is only a few weeks before they are all in operation.

The question, then, which we have to ask is: Do these sense-organs in their early functioning yield, or are they capable of yielding, specific sense-qualities, the qualitatively distinct sensations of the adult? In the adult the stimulation of an end-organ by its appropriate stimulus yields a sensation of specific quality. Moreover, it is incapable of yielding any but its own peculiar sensation-quality. Hence it is natural to conclude that if the corresponding end-organs in the child are capable of functioning, and if their excitation is transmitted to the cortex, there is experienced by the infant a sensation of similar specific quality to that experienced by the adult under similar conditions.

This assumption, in spite of its general acceptance, seems upon examination to be highly questionable. Appeal may be made to two sorts of evidence. First, there are the anatomical and physiological facts and, what is more important, the general psycho-physical theory in the light of which these facts are to be interpreted. Secondly, there is the psychological evidence of the child's behavior. Neither of these, as I shall attempt to show, supports the assumption.

A great advance in psycho-physical theory has taken place during the last quarter-century. This has been due to the growing realization by psychologists that the brain is, and must be regarded as, the organ of bodily *integration*, and not as the "seat of consciousness." This simple but profound insight has already led to momentous consequences, since the days when it was first proclaimed by Avenarius. The treatment of instinct and emotions, attention and cognition has been and is being revolutionized by it, and it has even given rise to a new school of psychologists, the "behaviorists." Nevertheless the traditional view of the sensation, the conscious "element," and its relation to perception has remained practically untouched; and this despite the application of the new theory to perception by Professor Dewey in his pregnant article, "The Reflex Arc Concept"[6] nearly twenty years ago, and his recent development of the same theme in "Perception and Organic Action."[7] That such a reinterpretation of the nature of perception must involve a corresponding reinterpretation of the nature of sensation is obvious. If perception is not to be adequately treated as a complex of associated sensations and sense-images, sensation is not to be adequately treated as an element, either genetic or analytic, of a conscious complex.[8]

[6] *Psych. Rev.*, 1896.

[7] This JOURNAL, Vol. IX, page 645.

[8] The former article of Professor Dewey's is a protest against the view that a given stimulus is experienced as a determinate existent regardless of the response it calls out. Strictly speaking it is a "given stimulus" only in so far as it calls out a given response. "In other words, sensation as stimulus does not mean any particular psychical *existence*. It means simply a function, and will have its value shift according to the special work requiring to be done. . . . Generalized, sensation as stimulus is always that phase of activity requiring to be defined in order that a coordination may be completed. What the sensation will be in particular at a given time, therefore, will depend entirely upon the way in which the activity is being used. It has no fixed quality of its own. The search for the stimulus is the search for exact conditions of action; that is, for the state of things which decides how a beginning coordination should be completed" (*Op. cit.*, p. 368). It is important to note that Professor Dewey uses "sensation" as equivalent to "conscious stimulus" (*Cf. op. cit.*, p. 368). Whatever value or character the stimulus is experienced as having is "sensation." Thus "sensation" is relative. As used in the present discussion, the term corresponds to the "sensation" of analytic psychology. It signifies the irreducible elements of sense as they appear to the analytic attention of the psychologist—the hues of the color-pyramid, the pure tones, the colds, and pressures, and muscular sensations experienced under experimental conditions. As thus used, the term is not relative but absolute. The problem here discussed is, one might say, the converse of Professor Dewey's; for while he has shown that what conscious stimulus—what experienced content—follows the discharge of a given set of end-organs, depends on the response evoked, my inquiry is: what are the conditions under which the stimulation of a given end-organ yields the specific quality attributed to it by the doctrine of specific energy?

The realization of the fact that the brain is the integrative organ of the body involves the conclusion that conscious processes are not to be treated as correlates of the chemical discharge of cells in the cortex. So long as the brain was conceived primarily as the seat of consciousness, the organ by means of which, in some mysterious fashion, the incoming nervous excitation was transmuted into an impression of sense, one might speculate with Tyndall over the possible correlation between a "left-handed spiral motion" of atoms and the emotion of love. One might conceive the whole course of conscious experience of an individual as an accompaniment to a marvelously intricate dance of atoms, the complicated pattern of which was somehow a "correlate" if not a "cause" of the hopes and fears and thoughts of the individual, and the exact mechanical reproduction of which in space and time would reinstate the same sequence of conscious events. All such speculations and the familiar modes of thought which issued in them are no longer permissible. We no longer find it profitable to think of conscious processes as correlated with the molecular transformations in the gray substance of the cortex. Instead we conceive of certain modes of functioning of the nervous system as "conscious," and we determine as well as we may what these modes are by reference to the conscious behavior of the individual. If the destruction or injury of certain areas of the cortex brings about the loss of a certain definite body of conscious content—*e. g.*, as the lesion of the visual center brings about blindness, that is not because a certain group of *cells* is destroyed, but because a certain *functional center* is put out of commission. Leave the cells intact and sever their efferent connections, and you achieve the same result. In other words, it is only because that group of cells has developed the functional differentiation peculiar to it that we can suppose it capable of yielding the specific visual sensation qualities. We attribute the visual qualities to this "visual center" precisely because the discharge of the cells of this center is an integral and essential part of the nervous function of seeing. That they are discharged by the stimuli coming from the retinal end-organs is only a half, or a quarter, of the story, just as their location in the occipital lobes, facilitating certain nervous connections, is probably another quarter. The thing that counts is the peculiar specialization of function. There is no possible justification for stopping short in our physiological explanation with the discharge of the cells of the cortical centers, and yet it too often remains to the psychologist what the marriage altar is to the romantic novelist.

Suppose we turn now directly to the question whether the infant experiences sensations similar to those of the adult, as soon as his

sense-organs are capable of functioning. According to the generally accepted opinion of physiologists and genetic psychologists, this depends solely on whether the nervous excitation is capable of reaching the higher sensory centers. In the work of Miss Shinn, for example, which may be taken as fairly representative,[9] we find her, when the psychological evidence of the experiencing of sensation-qualities is ambiguous, repeatedly falling back on the anatomical evidence, and accepting as conclusive the fact that the sensory fibers at the period in question are medullated to the cortical centers. She writes: "If the sensory impulses find functional conducting paths to the highest sensory centers, those of the cerebral cortex, we can have no reason to doubt that feelings of like quality with our own are associated with the central discharge."[10] And again, referring to Flechsig's discovery of the importance of medullation: "According to his [Flechsig's] researches, there is every anatomical reason to suppose that a limited number of impulses can in fact penetrate to the highest sense centers, and that a number of the reflexes observed in the new-born infant are of cortical origin. Where we find the child, then, behaving as if it felt a sense-impression, and when it is known to be anatomically possible that this impression should reach the highest sense centers, we have twofold evidence, which gives us practical certainty of the presence of sensations like our own."[11]

Now in opposition to this representative opinion I should suggest that we have reason to suppose that the stimulation of the cortical centers of the infant yields sense-qualities like our own, only in so far as these cortical areas are indeed functionally differentiated centers like our own, capable of mediating responses like our own. But such they notoriously are not. They possess at first a minimum of functional differentiation. Practically any sense center may yield from the start typical pleasant or unpleasant reactions, and each almost from the start calls out motor reactions in the organ stimulated. Thus the earliest response to light stimulus is a turning the head toward the source, and blinking. This is at first, perhaps, a reflex controlled by the sub-cortical centers; but the first cortical responses are of the same sort. In addition to these are the signs of

[9] "Development of the Senses in the First Three Years of Childhood." *Univ. of Cal. Publ. in Educ.*, Vol. 4. I say "representative" without intending to imply that Miss Shinn's utterances on theoretical matters are to be regarded as authoritative. She is, indeed, recognized as an able investigator, and her observations are widely quoted with respect. The leaders in psychological theory are more guarded in their expressions, and it is harder to find them committing themselves in quotable passages. Miss Shinn represents the traditional doctrine implicitly accepted by the great body of psychologists.

[10] *Op. cit.*, page 19.

[11] *Op. cit.*, page 20.

excitement—the aimless movements of arms and legs. But these are likely to follow the stimulation of any center. In other words, the discharge of the cortical sensory areas follows at first no well-marked paths of motor reaction. It is more likely to follow the short cut back to the region whence it came than any other; but otherwise it overflows in every possible direction, calling out motor reactions of the whole body. Moreover, the possible paths open to it are narrowly restricted. There are few associative connections with other higher centers open to it, for these develop late. If we compare the functioning of a sensory center of the infant with that of the corresponding area of the adult, the difference is enormous. Instead of a few possible avenues of escape, all leading directly to muscular response, there are a countless multitude of possible paths open. Moreover, the possibilities are not indifferent. There is no general spilling-over of the response, but an infinitely complicated system of responses, most of them highly indirect, and involving the coordinated action of many sensory centers. To suppose that this remarkable functional development, unparalleled in any other field of the organic world, can take place and leave the conscious content, mediated by the functioning of the center in question, untouched, is an enormous assumption. And yet that is what is implied in the accepted view. Thus Miss Shinn, summarizing the conclusions to be drawn from the evidence as to the child's sensibility at birth, writes: "These early experiences, then, unassociated with each other, unassociated with representations of their own former occurrence, are justly to be regarded as *pure sensations*, the simplest forms of consciousness we can conceive. In such experiences as these, there can be no consciousness of space, of externality or internality, of surrounding objects, or of self. Yet since each has its specific quality, these accumulating experiences, once associated, discriminated, remembered, and compared, afford the material for highly developed psychic life."[12] And again: "We start out, then, with a content of unconsciousness made up of a limited number of pure sensations, unrelated, unrecognized, unlocated, but varying distinctly in intensity, in affective quality, and in specific quality, . . . from the first a considerable mass of psychic material, awaiting only organization."[13]

[12] *Op. cit.*, page 47.

[13] *Op. cit.*, page 49. This passage may well be contrasted with another which seems to me to express a truer insight. Miss Shinn has been criticizing the famous descriptive phrase of William James—"a blooming buzzing confusion," which, she says, "could apply only to a Minerva sprung fully formed from the forehead of Jove." She continues: "Rather does the babe drift softly in among phenomena, wrapped away from their impact in a dim cloud of unconsciousness, through which but the simplest and faintest gleams and

But if we accept the general principle—which indeed all psychologists do accept *as* a principle—that the conscious life of the individual is to be connected with the integrative *functioning* of the nervous system, and not with the chemical discharge of the molecules of gray matter, we no longer have the slightest ground for supposing that the stimulation of the so-called sensory centers of the infant yields sensations of the same specific quality as our own. We no longer have any ground for supposing—nay, the whole presumption is against our supposing—that the enormous differentiation of function which the sensory centers undergo during the months of infancy leaves unmodified the content mediated by them. There can be no "mass of material awaiting only organization." Rather is it true that the very process by which that organization is brought about is the process by which the "material" is itself differentiated. The process of organization which issues in the perception of objects in space is the process by which the visual and tactual and auditory *qualities* of those objects come to consciousness; the process by which the sensations with their qualitative specificities are generated.

But what of the behavior of the child? Does the infant behave as if he experienced our specific sense-qualities? He undoubtedly responds, if not at birth, then soon after, to stimulations received through the special sense-organs. He sees and hears and feels in some way; but that he is experiencing visual and auditory and tactual sensations is more doubtful. What sort of evidence would be required to determine that an individual experiences, or is capable of experiencing, a certain sensory content? Simply and solely the fact that he discriminates, or is capable of discriminating such content in his behavior. Now the infant notoriously does not and can not by his behavior discriminate sensation *qualities*. His behavior, so far as it is more than reflex, consists in a few vague instinctive responses. Moreover his responses are at the beginning all of the sort called "type-reactions." The range and variety of his behavior are far too limited to permit of any discrimination of sensation qualities.

In the early months of infancy it seems to be the so-called higher senses which play the greater part in the child's life. Taste and smell are apparently rudimentary. The child sucks at anything with which its lips come in contact, even contentedly sucking a strong solution of quinine. Smells have been found to call out the same

echoes make their way to him. Then month after month the multiplex vision from without clears itself from the background of cloud, bit by bit, everything grouped and ordered for him in the very process of coming to his consciousness —a wonder and a joy to him, and the most beautiful of all unfoldings to see" (pages 144–145).

reflex sucking response if the stimulus is mild; if stronger, grimaces and choking, which may well be reflex, also, and in any case are no evidence of the experiencing of specific smell qualities.

As to dermal sensibility, reactions are aroused from the earliest days by contact, heat, cold, and what to an adult would be pain stimuli. But these are not discriminatory responses. So far as they differ at all from each other, it seems to be only by way of pleasantness and unpleasantness. I learn from Miss Shinn that in Genzmer's experiments with infants two or three days old the response to needle pricks was not a characteristic pain reaction, but similar to that following contact stimuli, although the slower physiological time and the difference in location of the sensitive spots were evidence that it was the pain end-organs which were stimulated. "It would seem, then," comments Miss Shinn, "that the paths which belong specifically to pain conductions can be permeable, and yet no specific feeling of pain be excited in the subject. The conjecture follows that in this case the excitations reach only the primary centers, and that it is only in the highest centers that pain impressions and contact impressions are differentiated. Yet characteristic pain reactions can not always be regarded as evidence that the higher centers are involved, for the acephalous infant mentioned above, and a similar one examined by Flechsig, both reacted (very feebly) with cries when the skin was slapped or pinched. The facial expression of discomfort and the generally disturbed behavior is safer evidence that pain is really experienced than the mere cry. Even these are, after all, signs of disagreeable feeling in general, not of pain specifically. Still, knowing how much more restricted are the paths of motor expression than those of sensory impression, and how invariable in later life is the rule that excitations of specialized nerve-ends never produce any but the special corresponding sensations, we may reasonably conclude that when a stimulus calculated to excite the nerves of pain is applied, and general signs of discomfort follow, the form of discomfort experienced is really pain."[14] This is a typical case of falling back for support upon physiological doctrine. And yet the only possible evidence available in support of physiological doctrine is behavior. The young infant is incapable of expressing any but "general discomfort." So far as the evidence from behavior goes, that is all he is capable of feeling.

Visual stimulation brings out responses almost from the first. The early responses, as is usually the case, involve movements of the organ or part stimulated. The child, at first apparently by a reflex adjustment, although soon by central control, turns its head toward

[14] *Op. cit.*, page 35.

the lighted part of the room. Later the eyes fixate the source of light, or bright objects and surfaces. In addition to the local response there is a typical response of pleasantness. The type-reactions of pleasantness and unpleasantness are indeed almost invariable accompaniments of the more specific responses. The point is that *any* stimulus of the organ in question brings out the same sort of vague local response. The only sort of discrimination in any sense department is for long what one may call a "preferential discrimination." Some stimuli, that is, call out a stronger response than others, together with a more marked pleasant or unpleasant reaction. Thus bright and glittering objects, or surfaces with marked light and shade contrasts are gazed at longer and more exclusively, and bring out marked signs of pleasurable excitement.

In regard to color sensitivity proper, a number of interesting investigations have been made, notably by Baldwin, MacDougal, Shinn, Chas. S. Myers, Helen Thompson Woolley, and C. W. Valentine. The conclusions drawn by these investigators on the basis of their methods rest upon assumptions of fundamental theoretical importance. The experiments of all of these psychologists, with the exception of Valentine, were made with infants in the grasping period, and the conclusions drawn were based on the number of times papers, wools, etc., of various colors and presented in various ways, were grasped after.

In Mrs. Woolley's tests, for example, pairs of colored paper discs of similar texture, shape, and brightness were presented to the child in a series of 10–12 choices, half in each of two positions, to eliminate preference for position or hand used. It was found that red was decidedly preferred to blue, green, and the black-white series, although no appreciable preference was shown for red over yellow. Yellow, when paired with blue, green, and the black-white series, however, stood even with blue, behind black, and well ahead of green, white, and gray. Mrs. Woolley concludes that red, blue, and yellow were perceived as colors, but that it was uncertain whether green was perceived as a color. That is, what was shown was that the child preferred, in a more or less marked degree pieces of paper of certain colors to those of certain others. Now is this evidence that the child experienced sensations of the same specific quality that an adult would have done? It seems to me at least doubtful. Even more doubtful are the conclusions reached by Valentine.[15] The grasping method is, of course, not applicable to children before, at least, the fifth month, since before that time the grasping instinct is not sufficiently developed. Valentine wished to test younger children and

[15] *British Journal of Psych.*, Vol. 6, page 363.

made the attempt with an infant of three months by observing the relative lengths of time wools of different colors were gazed at. Two wools of different colors were presented side by side against a dark gray coat, slowly drawn apart 8 inches, and left motionless. A record was kept of the number of seconds the child gazed at either wool, or at neither, for a period of two minutes from the time the child first looked at either. Then a rest interval was allowed, after which a new test was made, care being taken to eliminate any preference of position by interchanging the colors. The order of preference of the different colors (yellow, white, pink, red, brown, black, green, blue, violet) was determined by percentages figured by comparing the total number of seconds each color was gazed at, with the total number of seconds it might have been gazed at. Valentine found that yellow stood highest, with white and pink close second and third; red, brown, black, green, and blue next, in order given, while violet was markedly below all the others. These preferences were not, Valentine argues, based wholly on brightness, since yellow stood higher than white, and red higher than blue or green, and much higher than violet, although of the same brightness with them. He draws the conclusion, therefore, that sensations of red, yellow, green, blue, and brown were all experienced by the infant. But surely this is scarcely warranted by the evidence. The response of gazing is of the simplest sort, comparable to a mere tropism, and the fact that certain colors are more effective stimuli to this response than others is no indication of *quality* of sensation. The phenomena would seem rather to be allied to the known greater physiological influence of the so-called "warm" colors, notably red, discovered by Féré.[16]

If the evidence from behavior is to be taken on its own merits, we can attribute a qualitative difference to two stimuli only when responses are correspondingly different in kind. Mere "preferential discrimination" is not sufficient. It is only preconceived psychophysical theory which gives one any reason whatsoever for supposing otherwise.

The tests used with an older child or an adult for color-blindness all involve a *sorting* of the colored materials, an *arrangement* of them in serial order. This, of course, implies the perception of colors as like and different, and as more or less like and different. Each tint or shade brings out a response appropriate to the specific character of the stimulus and characteristically different from the response demanded by every other tint and shade. The responses themselves form a series of graduated acts commensurate with the series of stimuli. This is a sort of behavior of an altogether different order from the merely "preferential discrimination" shown by the gazing or

[16] Referred to by Valentine, *op. cit.*, page 375.

grasping infant; and it is a sort of behavior of which the infant is utterly incapable. To suppose that in spite of this incapacity, the infant receives sensations of the same specific quality as does the older child who places orange between red and yellow, and purple between red and blue, seems to be an unwarranted and wholly unnecessary assumption. What makes it plausible is that it is difficult for us to imagine why the yellow and red are preferred to other colors (as they usually are), if they are not seen *as* "red" and "yellow." When brightness and saturation differences are ruled out, what other difference between a bit of red and a bit of blue paper exists to make the one more attractive to the baby than the other? But this question rests, it seems to me, on a false conception of the whole matter. It must, of course, remain unimaginable to us how the baby sees the red and the blue, for we have no terms in which to imagine it. Perhaps, however, we can imagine what it would be like to see things as simply and vaguely "red" and "blue," and not as scarlet and cardinal and crimson, nor as turquoise and ultra-marine and sapphire, for many of us habitually see the hues and tints of things thus loosely, and all of us do frequently. We may be vaguely aware of one wall-paper as pleasing and another as displeasing, without having any idea of what hues the papers are. We may literally never have *seen* the hues which we now on examination see them to have. Now the infant's color consciousness in its early stages may well be analogous to this. To say that he first sees all objects as *gray*, and later on begins to see washed-out reds and yellows is, I believe, a falsification. It is carrying over the terms descriptive of the highly differentiated structural elements of a late stage in evolution and applying them to the structures of an earlier and simpler type.[17]

Of qualitative diversity and specificity such as is experienced by the adult, there is, so far as I can see, no positive evidence given by the behavior of the child during the early months of infancy. The earliest discriminations in response would seem to be between what is pleasant and unpleasant. Along with this goes from the first a localization of response, the earliest reactions being movements of

[17] It is worth while to quote in this connection a paragraph from Chas. S. Myers (*Br. Jr. of Psych.*, Vol. 2, page 360): "Surely it is more likely that vibrations of whatever frequency, so long as they affect the infant's retina and cochlea at all, at first evoke merely sensations of light and sound, and that from this primary experience of light the colored and colorless series of sensations become gradually and simultaneously differentiated, while from the primary experience of sound tones of various pitch and noises are similarly differentiated from one another. It seems to me most improbable that, in the development of the individual or of the race, sensations of one color region or of one tone region develop before those of other regions. I look on the process of sensory development as a gradual unfolding, a gradual appearance of diversity among experiences which earlier seemed identical."

the organ or part stimulated, often to facilitate or prevent further stimulation: as the turning the head and eyes toward the light, the attitude of listening, the sucking at whatever touches lips or mouth, the clasping which follows a touch on the palms, etc. From the first there seems good evidence that visual, auditory, and dermal stimuli are experienced as different from each other in a way which might be loosely described as difference in quality. That dermal stimuli of contact, heat, cold, and pain are experienced as qualitatively distinct seems more doubtful. One might venture the opinion that "local sign" is developed earlier than differences in specific quality.

In conclusion I wish to say a few words as to the positive character of the early experience of the baby. It is often, perhaps usually, believed that it is a passive experience, that the baby is ushered into a world of kaleidoscopic confusion, a multitude of fleeting impressions or presentations, which in William James's phrase "come and are and have their being," and which only slowly and gradually acquire order and significance. So far from this being true, I believe one might rather say that the baby's world contains neither confusion nor separate impressions which can be "presented" or have "being." It is rather a world of imperative urgencies and impulsions, so immediate that the presentation is lost in the effort of looking or grasping or sucking or shrinking, as with us the quality of the itch is lost in the urgency to scratch, or the quality of intense pain in the shrinking from its intolerable unpleasantness. Only—and this is an enormous difference—we can refrain from scratching, and can to some extent conceal our suffering, whereas for the baby to feel *is* to suck. Just as there is no possibility of inhibition and choice of response, so there is no experienced "what" of the stimulus. What it is and what it demands are so telescoped together that both are lost, and there is an experience which is neither sentient nor noëtic, but something simpler than either. The conception of "pure sentience" is one gained by abstracting an aspect of our own experience. For us, the sensuous world has lost, to a large extent, its immediate urgencies; and so, from the vantage-ground of our very indifference, we can in passive contemplation savor its qualities. But for the baby the conditions for this are all wanting. Because the sights and sounds and smells are experienced only to be immediately responded to, because they permit no choice of response, they have acquired no true significance and no specific character as presentations.

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(*To be continued*)

HELLENIC CIVILIZATION[1]

SINCE the appearance in 1870 of Bishop Stubbs's "Select Charters," our pioneer "source-book," scholars have generally recognized the high value of source collections and translations for historical study. If the "institutional" and the "economic" interpretations of history have each in turn sharpened the vision of research, bringing to light much neglected or overlooked evidence of the life of past generations, the present eager striving for a more intensive sociological interpretation promises even more precious fruit. Under the new social inspiration the study of antiquity is gaining a deeper meaning. In particular the exploration of the remains of the Grecian and Roman civilization is receiving a novel impulse. Historians are rereading their original sources to good purpose. Some recent scholastic events seem to warrant the belief that the study of the "classics" is about to yield its richest harvest: for the vision of the new humanism is so much keener than the vision of the old humanism. It may yet be possible to reconstruct the actual social life of Italic and Hellenic humanity.

"The Hellenic Civilization"—the first volume published in the projected series of "Records of Civilization"—is an earnest of that event. In several respects it is a notable achievement. Editorially, the workmanship is of first-rate quality. To produce an up-to-date source-book in this field has required profound scholarship and rare critical power. Typical passages had to be selected from an immense mass of materials, much of which has been accumulated by recent archeological research. The bibliographies, the critical notes, and the introductory chapter on the sources of Hellenic history are all admirable; yet it is the character of the selections actually made which now chiefly challenges our attention. These extracts cover a wide range of topics marking the progress of culture from the Minoan age to the early centuries of the Christian era. It is significant of the thoroughly modern viewpoint of Dr. Botsford and his colleagues that practically the whole material lies in the broad field of the social sciences. The student of religion, jurisprudence, politics, economics, or sociology will here find aid; while often he may be surprised to discover that questions, which perchance he fancies have arisen only under present-day conditions, were familiar to Greek thinkers thousands of years ago. Even in the Minoan age (3000–

[1] "Hellenic Civilization." Edited by G. W. Botsford and E. G. Sihler, with Contributions from William L. Westermann, Charles J. Ogden and Others. New York: Columbia University Press, 1915. In "Records of Civilization: Sources and Studies." Edited by James T. Shotwell in collaboration with other scholars of Columbia University and Union Theological Seminary.

1200 B.C.) attention is called to survivals of social and political conditions. Some illustration of the value of this source-book for the study of society may, perhaps, prove enlightening.

In the outset, "it is a remarkable fact," as Dr. Botsford points out, "that twenty-five hundred years before the dawn of anthropology a Greek dramatist should come so near the truth regarding the origin of civilization." Thus Æschylus causes Prometheus—friend of mankind and mythical ancestor of the Hellenic race—to explain the evolution of culture under his guidance:

"They (mortals) in the first place, though seeing, saw to no purpose, hearing, they did not understand; but like the forms of dreams, during all that long time they did everything in a confused and random way, and knew not brick-built houses turned to the sun, nor the craft of carpentry. But they used to dwell in holes made in the earth, like the tiny ants in the sunless recesses of caves. Further, they had no sign either of winter or of flowery spring, or of fruitful summer, to rely upon, but they used to do everything without judgment, till at length I showed them the risings of the stars and their laboriously determined settings. Moreover, numbers, the best of inventions, I devised for them, and the combining of letters, at once the origin of literature, and the means of remembering every event. I was the first, too, to join together under the yoke the animals that served them," to find "out for them the sea-traversing canvas-winged cars to convey mariners," as also medicines, "ways of divination," and "those great benefits to man which lie hidden under the earth,—copper, iron, silver, and gold."

The collection affords many a vivid glimpse of commercial, industrial, and economic conditions. "In ancient Greece," according to Botsford, "the only banks which could in any sense be described as public were the temples"; while "private banks were a development from the money-changer's trade, which lay in the hands of slaves and freedmen." The great speech of Demosthenes in "Behalf of Phormion" shows that banking operations in Athens were very similar to those of our day. The method "was to receive deposits on interest, which were then invested on security of land or capital; letters of credit were issued; and sometimes the banker engaged personally in commercial transactions." Banking stock claimed by the plaintiff, Apollodorus, is mentioned in the speech of Demosthenes given in the text.

In view of the extensive use of moratoria by England for the steadying of exchange at the beginning of the present European war, the moratorium of about 147 B.C., declared for a different purpose by Critoläus, general of the Achæan League—who "was determined to bring on a war with Rome"—may have the spice of timely interest:

"Critoläus . . . sent round orders to the magistrates not to expect money from debtors, nor to receive prisoners arrested for debt, and to cause loans on pledge [real estate mortgage] to be held over until the war should be decided. By this kind of appeal to the interests of the vulgar everything he said was received with confidence; and the common people were ready to obey any order he gave, incapable as they were of taking thought for the future, but caught by the bait of immediate indulgence and relief."

It is clear from the "Letters" of Alciphron, written about 200 A.D. and referring to conditions in the fourth century B.C., that the "loan-shark" was busy in ancient Hellas:

"The usurers in the city, kind friend, are a great nuisance. I do not know what was the matter with me when I ought to have gone to you or some other of my country neighbors, at the time I was in need of money for purchasing a farm at Colonus. On that occasion a man of the city went with me to the house of Byrtius to introduce me to him. There I found an old man looking wrinkled and with brows contracted, holding in his hand an antique paper, rotted by time and half-eaten by moths and bugs. Forthwith he spoke to me in brusquest fashion, as though he considered talking a loss of time. But when my voucher said I wanted money, he asked how many talents. Then when I expressed surprise at his mention of so large a sum, he forthwith spat, and showed ill temper. Nevertheless he gave the money, demanded a note, required a heavy interest on the principal, and placed a mortgage on my house. A great nuisance indeed are these men who reckon with pebbles and crooked fingers. Never, ye spirits who watch over the farmers, never may it again be my lot to behold a wolf or a usurer!"

An oration of Lysias shows that the most daring "plunger" of the modern board of trade "has nothing on" his Athenian prototype who was quite capable of engineering a "corner on grain," although death was the prescribed legal penalty for so doing:

"For when you happen to be most in want of grain, they grab it and are unwilling to sell, and you may be well satisfied to buy from them at any price whatever and take your leave of them, so that sometimes when there is peace we are reduced to a state of siege by them."

It appears from Plato's "Protagoras" that the "muck-maker" in Greece produced his natural complement the "muck-raker." The "knocker" was detested as much by the ancient as he is by the modern "town-booster":

"Bad men, when their parents or country have any defects, look on them with malignant joy, and find fault with them and expose and

denounce them to others, under the idea that the rest of mankind will be less likely to take themselves to task and accuse them of neglect; and they blame their defects far more than they deserve, in order that the odium which is necessarily incurred by them may be increased; but the good man dissembles his feelings, and constrains himself to praise them."

Many extracts are helpful in studying the family life of the Greeks. The dialogue between Socrates and Ischomachus, taken from Xenophon's "Economicus," gives a realistic picture of the place of the wife in the management of the household. "Some thinkers of the age," remarks Professor Sihler, "were of the opinion that there were no differences betwen women and men, that women should have the same education as men, and should follow the same occupations, even politics and war." On the contrary, "Xenophon was convinced that women, though the equals of men, were in important respects essentially different, and that there should accordingly be a division of labor—that the sphere of woman or of man was only a hemisphere." Marriage should be an even partnership for all life:

"Did it ever strike you to consider, dear wife," says Ischomacus, "what led me to choose you as my wife among all women, and your parents to entrust you to me of all men?" In each case, it was to discover the "best partner of house and children. . . . If at some future time God grant us to have children born to us, we will take counsel together how best to bring them up, for that too will be a common interest, and a common blessing, if happily they shall live to fight our battles and we find in them hereafter support and succor when ourselves are old. But at present there is our house here, which belongs alike to both. It is common property, for all that I possess goes by my will into the common fund, and in the same way all that you deposited was placed by you to the common fund. We need not stop to calculate in figures which of us contributed most, but rather let us lay to heart this fact that whichever of us proves the better partner, he or she at once contributes what is most worth having." Ischomachus tells Socrates that his "wife is quite capable of managing our domestic affairs without my aid"; but she was not well skilled to perform her household duties when she came to him. "What proficiency was she likely to bring with her, when she was not quite fifteen at the time she wedded me, and during the whole period of her life had been most carefully brought up to see and hear as little as possible, and to ask the fewest questions?" Though, "as regards control of appetite and self-indulgence, she had received the soundest education, and that I take to be the most important matter in the bringing up of man or woman." Accordingly after marriage Ischomachus became his wife's teacher in home economics.

Greek husbands did not all accept Xenophon's ideal of wifehood and Greek wives were not all so docile as was the "partner" of Ischomachus, if we may trust these lines from Alexis of Thurii (300–290 B.C.):

> "Oh wretched are we husbands, who have sold
> All liberty of life, all luxury,
> And live as slaves of women, not as freemen.
> We say we have a dowry; do we not
> Endure the penalty, full of female bile,
> Compared to which the bile of man's pure honey;
> For men, though injured, pardon; but the women
> First injure us and then reproach us more.
> They rule those whom they should not; those they should
> They constantly neglect. They falsely swear;
> They have no single hardship, no disease;
> And yet they are complaining without end."

Usually the father gave his daughter in marriage and provided her with a dowry. "The grant of a dowry was legally advantageous to a wife and to her children in that it served as evidence of a legitimate marriage. As she could recover it in case of separation," continues Botsford, "it tended to make her marriage more stable. Although a dowerless wife was in these two respects placed at a disadvantage, it was considered generous and patriotic in a citizen to marry a poor dowerless girl." This idealism is illustrated by an interesting extract from the "Orations" of Lysias, which closes with this sentence:

"Well then, gentlemen of the jury, in case of a man who himself married a portionless wife and gave great dowries to his two daughters, but advised his son to take a wife with a small portion, is it not reasonable to believe in regard to him that it was not for the sake of money that he became a kinsman of these persons?"

That the Greek maiden sometimes rebelled against the choice of a bridegroom by her father, is disclosed by a passage from Aliciphron, where Glaucippe—who had been smitten by the charms of a youth whom she had seen at the Oschophoria, a "festival in which young men dressed in women's clothes marched in procession carrying vine branches loaded with grapes"—thus appeals to Charope, her mother:

"I can no longer contain myself, mother, nor can I endure to marry the young man from Methymna, the pilot's son to whom my father betrothed me, since I saw the city youth at the Oschophoria, when you sent me to the city at the time of that festival. He is beautiful, O beautiful, mother, and most sweet. He wears his hair in curls more charming than sea-moss; his smiles are fairer than the quiet sea, and the blue of his eyes is like the ocean when first lit up

by the sun's rays. His whole countenance—one would say that the Graces, after bathing in the fount Argaphia, had left Orchomenus and were dancing in his cheeks. His lips he has tinged with roses taken from the bosom of Aphrodite. Either I must marry him, or in imitation of the Lesbian Sappho, will throw myself from the promontory, not of Leucas, but of Peiraeus."

To which Charope made answer:

"You are mad, daughter dear, and entirely beside yourself. You need a dose of hellebore, not the ordinary kind, but the sort that comes from Phocian Anticyra; for you ought to feel a maidenly shame, but have cast off all modesty. Compose yourself and thrust from your mind this mischief. For if your father should learn a word of this, he would without a moment's thought or hesitation throw you as food to the sea monsters."

It may perhaps be too much to say that there was a feminist "movement" in ancient Hellas. Yet it is certain that various aspects of the "woman question" were already familiar to Greek thinkers. High-minded women were not content with the inferior position of the wife in the family; and they resented the husband's practically exclusive right of divorce. Thus exclaims Euripides's Medeia, whose husband, Jason, had repudiated her and taken another wife:

"Of all things that have life and sense we women are the most hapless creatures; first must we buy a husband at an exorbitant price, and o'er ourselves a tyrant set which is an evil worse than the first; and herein lies a most important issue, whether our choice be good or bad. For divorce is discreditable to women, nor can we disown our lords. Next must the wife, coming as she does to ways and customs new, since she hath not learned the lesson in her home, have a diviner's eye to see how best to treat the partner of her life. If haply we perform these tasks with thoroughness and tact, and the husband live with us, without resenting the yoke, our life is a happy one; if not, 'twere best to die."

Socrates, in Plato's "Republic," rejects the notion, still held by many in our day, that the division of social work should be determined by nature's sex-division of function; that is, by motherhood and fatherhood; while he champions the political capacity of woman. In a tone which would delight the author of "Women and Economics," he raises and negatives the following question:

"Are dogs divided into hes and shes, or do they both share equally in hunting and in keeping watch and in the other duties of dogs? Or do we entrust to the males the entire and exclusive care of the flocks, while we leave the females at home, under the idea that the

bearing and suckling of their puppies is labor enough for them. . . . The only difference between them is that the males are stronger and the females weaker. . . . Then if women are to have the same duties as men, they must have the same nurture and education." It is right to maintain the "general inferiority of the female sex: although many women are in many things superior to many men." So "there is no special faculty of administration in a state which a woman has because she is a woman, or which a man has by virtue of his sex, but the gifts of nature are alike diffused in both; all the pursuits of men are the pursuits of women also, but in all of them a woman is inferior to a man."

At Athens, as early as the close of the fifth century some members of the intellectual classes were in favor of granting the suffrage to women. The "Lysistrate" of Aristophanes, says the editor, "is interesting as the first-known piece of literature which treats of 'woman's rights.' Aristophanes proposes, between jest and earnest, that the women of Athens should assume the reins of government, make peace with the Peloponnesians, join the allies on equal terms with the Athenians in 'one mighty political aggregate,' and improve the administration in various ways." Lysistrate is surely the pioneer feminist and her speeches have a strangely familiar sound. The delightful dialogue in which she shows how women would socialize diplomacy and purify politics is too long for quotation here.

The modern pacifist will find in this collection materials to sustain his views. We are coming to realize that war and militarism, like all social products, are the result of choice and habit; and, like many other social products, they are due to misselection of the means to satisfy human cravings, whether or not such cravings are welfare needs. The war-struggle theory of organic and social progress, of "survival of the fittest," is a sinister fallacy, a perverse blunder, for which both the biologist and sociologist are to blame. We are questioning the universality and the importance of the so-called "instinct of male pugnacity," and are laying the accent more on the "peaceful inheritance of our species." War is not even a universally acquired human habit. It must be charged mainly to the selfish motives of a few exploiters, the war-lords; not to the spontaneous desires of the masses of men, much less the masses of women. This idea, too, was known to the Greeks. Speaking of wars among the Hellenes, Plato, in his "Republic," wisely makes Socrates say:

"They know that the guilt of war is always confined to few persons and that the many are their friends."

The present European conflict with frightful emphasis is repeating the great lesson of history; for war, the capital mistake of a

male-made world, is always and everywhere the scourge of womanhood. In every war the heaviest cost falls on woman, the race-bearer and the race-conserver. The fighting soldier pays less. Woman endures harder things than dying in battle. To this fact Euripides's Medeia bears witness:

"With their sorry reasoning," she exclaims, "they say we live secure at home while they are at the wars; for I would gladly take my stand in battle array three times o'er than once give birth."

Possibly the examples here presented may suggest the richness of this source material for an intensive study of the social life of Hellas. Completed in the same spirit, the series of volumes as planned will much advance our knowledge of the things worth while in the civilizations which have preceded our own.

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REVIEWS AND ABSTRACTS OF LITERATURE

Elementary Logic. ALFRED SIDGWICK. Cambridge: Cambridge University Press. 1914. Pp. x + 250.

Mr. Sidgwick regards traditional logic as a word-game that is played with syllogisms. The skilful player must be entirely familiar with the rules of the game and with the technicalities they involve. Even in the class-room where logic survives as "sober doctrine" it is best to treat it as a game, for then "it can be easily mastered and as easily forgotten" (p. 2). The main interest of Mr. Sidgwick's book lies, however, not in his treatment of the old system of logic as "a carefully limited subject to get up for an elementary examination" (p. viii), remarkable though this be for its simplicity, but in his account, for beginners, of a new system as "a free study of some of the chief risks of error in reasoning" (p. viii).

The fundamental assumption made by the old logic is that it is possible to separate form from matter in reasoning. Letter symbols, "counters devoid of meaning," are used for expressing the various syllogistic-forms, this device helping to conceal the absurdities which often arise when we try to find words to fit them. In fact the old system of logic is so excessively abstract that its whole tendency is towards viewing reasoning as a mechanical process. Mr. Sidgwick is well aware that, viewed as a theory of reasoning, it still has its devotees. Indeed, he revels in the fact that "there are people living even to-day to whom the conception of logic as a game seems little short of sacrilege" (p. 1). The trouble lies in the fact that such people do not realize that traditional logic is a survival from the days when classes of all kinds were regarded as unalterable facts of nature. Mr. Sidgwick, on the other hand, holds the "troublesome modern notion" that "classes are only our human way of grouping things to suit our pur-

poses, which are liable to change and vary" (p. 6). Modern science is remote from the conceptions in which logic has its roots. "Not petrified perfection, but gradually improving imperfection is our present ideal" (p. 112). We are no longer so interested in classes that are already recognized and in their extensive relation to one another. We want to know about things, how they may be produced and avoided, about the causes making them what they are.

But our thoughts about things can only be examined in the form of statements, and all statements are descriptive and hence incomplete. For beyond the completest account of a fact in general terms there lies some individual difference. Logic has not provided effective safeguards against this pervasive risk of ambiguity; nor can it do so, while it holds that propositions are formed by joining together terms, each of which has a meaning independent of the proposition in which it occurs. Of course Mr. Sidgwick recognizes that many terms have stable meanings which seldom present any difficulty. All meaning, however, depends on agreement and varies with our varying purposes. The meaning of any fact is most simply stated by making use of a general rule. So the chief problem of modern thought is the interpretation of general rules and their application to particular facts. The structure of reasoning is always syllogistic, for all syllogizing consists in applying general rules to particular cases. If we have no error of fact in the rule used, nor in the nature of the case in question, and yet have lack of connection between the two, this is due to ambiguity. No part of reasoning is safe against this ubiquitous source of error. To guard against it is the chief business of modern logic.

Mr. Sidgwick allows traditional logic to retain exclusive rights to its dignified capital letter. Its intentions are good, but its creation of a region in which it is infallible removes from its jurisdiction all the most dangerous errors to which reasoning is prone. As an active force "logic hardly exists now, except in some of the backwaters of philosophy, where men . . . make efforts to soar above the truth that is merely practical, and are rewarded by reaching results that are very much the reverse" (p. 153). Modern logic, on the other hand, recognizes thought to be purposive throughout, and its central subject is "the risks of reasoning, so far as they admit of being recognized and understood" (p. 170). It can not take the place of science. It can only help us to get a clear view of the problem at issue and to be watchfully on guard against ambiguity of the middle term. The new logic is more modest than the old, but it involves greater expense of thought and more flexibility of mind.

Mr. Sidgwick admits one weak point. Modern logic presents greater difficulties to the examiner, and perhaps as yet for the teacher. In it technicalities are subordinate; their names are less important than the uses to which they may be put! The doctrines of modern logic are simply different applications of its few main principles. However this may be, it seems certain that the study of logic as here conceived would stimulate interest to a far greater extent than is done by the usual college course. Most students of elementary logic make the same remark: "What is the

use of learning all these names? The only interesting part of logic is the fallacies." Is not this an indication of the need of just such reforms as Mr. Sidgwick suggests?

UNA BERNARD SAIT.

The Philosophy of Change. H. WILDON CARR. London: Macmillan and Company, 1914. Pp. xii–216.

Dr. Carr espouses M. Bergson's philosophy and presents an account of its principles in this book. Admirers of M. Bergson's philosophy will, if they read Dr. Carr's book, admire that as well. Not, however, that we assert an invariable proportion between the admiration of M. Bergson's philosophy as it may exist in particular minds, and the corresponding approval that might be excited in each such mind by the perusal of Dr. Carr's book. For although Dr. Carr, as we take it, has been true to the dominant spirit of M. Bergson's writings, and although his rendering of M. Bergson's conceptions seems in its essence correct, nevertheless (inevitably) the reduction of an elaborate doctrine to a fraction of its original compass would involve the omission of certain of that doctrine's specific marks. And so, in this version, M. Bergson's doctrine strikes one as rather more uniform, even, systematic, and definitely coherent, than it appeared in the volumes given to the public by M. Bergson himself. Change, taken as the explanation and the source of all things; and intuition, taken as the turning of the mind from its practical bent; these tenets, the expressly unifying tenets of M. Bergson's philosophy, come out very clearly—in fact they emerge quite starkly—in Dr. Carr's work. Those intent chiefly on the metaphysical perspectives of M. Bergson's work, therefore, comprising without doubt the majority of his readers, would find a satisfaction disproportionately considerable in reading this book. Those, on the other hand, who esteem M. Bergson's philosophy as an aggregate of parts more than they admire it for such of its aspects as endow it with whatever of explicit integrity it may chance to possess would, very likely, as they read Dr. Carr, discover the notion rising to a higher point in their minds than ever that in the rôle of a resolver of all of the problems of philosophy by the use of a couple of principles M. Bergson has been not only unoriginal, but conceivably, indeed, not unwittingly so. When he writes for himself M. Bergson produces the impression of a number of considerations overscoring and relieving the surface of his thought; and Dr. Carr, although he is delicate, suggestive, deft, and discreet, seems in a measure (however slight it may be), to explain the ideas of M. Bergson's philosophy in the sense of imperceptibly flattening them out. Not that the picture he presents of M. Bergson's philosophy is in the least degree flat, however.

What imparts the quality of relief to this picture is the enthusiasm with which Dr. Carr's mind is informed by M. Bergson's philosophy. The imperfections that lurk in M. Bergson's views, if we must acquiesce in the judgment of the majority of those who have expressed their opinion concerning these views, are to Dr. Carr as though they were not; further, Dr. Carr holds that the discovery of the "world beyond the atom" and the

triumphs of psycho-analysis lend confirmation to the system of philosophy that has won his adherence. Dr. Carr interprets M. Bergson's philosophy well, partly because he finds it corroborated everywhere—even in the most distant departments of science, and partly because he is unable to entertain in his mind unfavorable criticisms of his favorite doctrine. If it were true that he held to the letter of some parts of this doctrine more faithfully than even M. Bergson himself, this would, on the whole, be of advantage to a reader looking for an introduction to M. Bergson's thought. Dr. Carr's enthusiasm, then, is notable in the manner in which he has worked himself into M. Bergson's thought; it is notable, as well, in the manner in which he has worked his interpretation of this thought into the medium of the English language. Dr. Carr's writing is not only agreeable and fluent and lucid, but it fits idiomatically and snugly the singularity of many of M. Bergson's ideas. For instance, the homogeneous time that M. Bergson sets over against heterogeneous duration is designated "clock-time" by Dr. Carr; and Dr. Carr has many other phrases similarly neat. Dr. Carr's exposition, in a word, borrows a great deal of relief from this: that he has made the composition of this book a labor of love.

GEORGE PECKHAM.

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A History of Philosophy. CLEMENT C. J. WEBB. New York: Henry Holt and Company. Pp. 256.

This book may serve its purpose in a way not contemplated by its author or publisher. The reader of it, having found so little information about a mighty subject, may look elsewhere and thus pursue the study of the history of philosophy. A primer for the unprepared, telling about the whole history of philosophy, is what nobody can write. The subject can not be so popularized without losing all its substance. What the reader of any introduction should learn is that philosophy has never been child's play, and that it can not be conveyed in easy expositions. This is not to argue that small books should not be written on great subjects. It takes, however, a gift akin to genius to write them, and it is hard to see how a history of philosophy can be at the same time informing, small, and really elementary. The impression is too much like that produced by those extremely simplified arrangements of great music provided in albums *für die Jugend.* After all youth gets much out of them, and it is hard to say how much an eager and curious young person may not get out of Mr. Webb's book. He may, as we hope he will, read another book on the same subject, and thereby justify his introduction to it.

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JOURNALS AND NEW BOOKS

THE JOURNAL OF ABNORMAL PSYCHOLOGY. April–May, 1916. *The Subconscious Settings of Ideas in Relation to the Pathology of the Psychoneuroses* (pp. 1–18): MORTON PRINCE.–Antecedent personal experiences form the setting which gives an idea what we call its *experimental egocentric* meaning. The setting is necessarily represented, according to the principle of conservation, by subconscious dispositions. Dispositions are acquired and innate; the acquired ones become organized with the innate dispositions into a complex which functions as a whole. Any conserved disposition motivated by almost any emotional impulse may become a subconscious process. The writer emphasizes the importance of a knowledge of the subconscious for psychiatry. *Obsessions of Normal Minds:* (pp. 19–22) CHARLES SCOTT BERRY.–A study of the character and extent of obsessions in normal individuals was made. The two hundred subjects were in educational psychology classes, almost all seniors in the University of Michigan. They were asked the following two questions and given two days to answer them: (1) Do you have or have you any fixed ideas? (2) Do you have any ideas which involuntarily come to you when fatigued? About 25 per cent. said they had had fixed ideas. Several of their accounts are quoted. In studying these obsessions the writer is struck by two things: "First, that without external assistance the obsession in so many cases seems to run its course and disappears, or at least loses its emotional force; second, that in a large percentage of these cases the beginning of the obsession goes back to childhood." "A careful study of the mechanisms of the obsessions of normal minds by means of psychological methods of investigation which proved so successful in the study of pathological obsessions would doubtless be of value not only in adding to our knowledge of the obsessions of normal minds, but also in showing their relation to pathological obsessions." *Psychopathology of Every-day Life* (pp. 23–47): MEYER SOLOMON.–A critical review of Dr. Freud's theories. "The mind that accepts Freud's conclusions as true and the mind that can not accept these views are different kinds. They stand at opposite ends and can never meet on common ground in the matters under discussion. *The Apparent Inversion of Time in Dreams* (pp. 48–58): LYDIARD H. HORTON.–Statistically, dreams of the sensory, or *presentative* type exhibit a stronger general tendency to *oniric inversion* type than do those of the psychic or *representative* type. The apparent inversion of time in dreams is explained by the apperceptive delay. *Abstracts. Reviews:* Boris Sidis, *The Foundation of Normal and Abnormal Psychology:* HARRY LINENTHAL.–Walter B. Cannon, *Bodily Changes in Pain, Hunger, Fear, and Rage:* GEORGE V. N. DEARBORN.–J. G. Frazer, *Psyche's Task:* MEYER SOLOMON.–Leo Kaplan, *Gründzuge der Psychanalyze:* ERNEST JONES.–Paul E. Bowers, *Clinical Studies in the Relationship of Insanity to Crime:* JOHN T. MACCURDY. *Books Received.*

Brown, Warner. Individual and Sex Differences in Suggestibility. University of California Publications in Psychology, Vol. 2, No. 6. Berkeley: University of California Press. 1916. Pp. 291–430.

Campagnac, E. T. Converging Paths. Cambridge: Cambridge University Press. 1916. Pp. viii + 113. 75 cents.

Drake, Durant. Problems of Religion: An Introductory Survey. Boston: Houghton Mifflin Company. 1916. Pp. xiii + 425. $2.00.

Geyer, Denton L. The Pragmatic Theory of Truth as Developed by Peirce, James, and Dewey. 1914. Pp. 55.

Jenni, Leonhard. Jesus: Sein Leben und Wirken. Lugano and Mailand: Verlagshaus Coenobium. 1916. Pp. 21.

NOTES AND NEWS

JOSIAH ROYCE, Alford professor of natural religion, moral philosophy, and civil polity at Harvard Univerisity, died at his home in Cambridge, Massachusetts, on September 14. Dr. Royce was born November 20, 1855, in Glass Valley, California, and graduated from the University of California in 1875. After a few years of study abroad, he was appointed to a fellowship at Johns Hopkins University, from which he received his degree of Ph.D. in 1878. He had conferred upon him the honorary degree of LL.D., from the University of Aberdeen in 1900, from Johns Hopkins in 1902, from Yale University in 1911, from St. Andrew's University in 1911; the degree of Litt.D. from Harvard University in 1911, and that of D.Sc. from Oxford University in 1913. From 1878 to 1882 Dr. Royce was instructor in English literature and logic at the University of California. He joined the faculty of Harvard University in the latter year as an instructor in philosophy, rising through the various grades until he became Alford professor, in March, 1914. Dr. Royce was a fellow of numerous learned societies, and was the author of a number of volumes on philosophical subjects, among them: "Religious Aspects of Philosophy," "The World and the Individual," "The Spirit of Modern Philosophy," "The Conception of Immortality," "Herbert Spencer: An Estimate and a Review," "The Philosophy of Loyalty," "William James and Other Essays on the Philosophy of Life," "The Problem of Christianity," and his last book, "War and Insurance," published during 1914.

THE Boston City Council has passed an ordinance that will give the city police court a medical department and psychologic laboratory. All offenders will pass through this department, the verdict of which as to their mental condition will be taken into consideration before sentence is pronounced. Dr. Victor V. Anderson is appointed as head.

THE OPEN COURT PUBLISHING COMPANY announce a new book on the war, "Justice in War Time," by Bertrand Russell, lecturer and fellow of Trinity College, Cambridge.